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Case Reports

Improvement in Chronic Muscle Fasciculations With Dietary Change: A Suspected Case of Gluten Neuropathy

Brian Anderson DC, CCN, MPH [a,*], Adam Pitsinger DC [b]

[a] *Attending Clinician, National University of Health Sciences, Lombard, IL*
[b] *Chiropractor, Private Practice, Polaris, OH*

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Abstract

Objective: The purpose of this case report is to describe a patient with chronic, multisite muscle fasciculations who presented to a chiropractic teaching clinic and was treated with dietary modifications.

Clinical features: A 28-year-old man had muscle fasciculations of 2 years. The fasciculations began in his eye and progressed to the lips and lower extremities. In addition, he had gastrointestinal distress and fatigue. The patient was previously diagnosed as having wheat allergy at the age of 24 but was not compliant with a gluten-free diet at that time. Food sensitivity testing revealed immunoglobulin G–based sensitivity to multiple foods, including many different grains and dairy products. The working diagnosis was gluten neuropathy.

Intervention and outcome: Within 6 months of complying with dietary restrictions based on the sensitivity testing, the patient's muscle fasciculations completely resolved. The other complaints of brain fog, fatigue, and gastrointestinal distress also improved.

Conclusions: This report describes improvement in chronic, widespread muscle fasciculations and various other systemic symptoms with dietary changes. There is strong suspicion that this case represents one of gluten neuropathy, although testing for celiac disease specifically was not performed.

Introduction

There are 3 known types of negative reactions to wheat proteins, collectively known as *wheat protein reactivity*: wheat allergy (WA), gluten sensitivity (GS),

* Corresponding author. Brian Anderson DC, CCN, MPH, 200 E Roosevelt Rd, Lombard IL 60148, USA. Tel.: +1 630 889 6464; fax: +1 630 889 6843.
E-mail address: banderson@nuhs.edu (B. Anderson).

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and celiac disease (CD). Of the 3, only CD is known to involve autoimmune reactivity, generation of antibodies, and intestinal mucosal damage. Wheat allergy involves the release of histamine by way of immunoglobulin (Ig) E cross-linking with gluten peptides and presents within hours after ingestion of wheat proteins. Gluten sensitivity is considered to be a diagnosis of exclusion; sufferers improve symptomatically with a gluten-free diet (GFD) but do not express antibodies or IgE reactivity. [1]

The reported prevalence of WA is variable. Prevalence ranges from 0.4% to 9% of the population. [2,3] The prevalence of GS is somewhat difficult to determine, as it does not have a standard definition and is a diagnosis of exclusion. Gluten sensitivity prevalence of 0.55% is based on National Health and Nutrition Examination Survey data from 2009 to 2010. [4] In a 2011 study, a GS prevalence of 10% was reported in the US population. [5] In contrast to the above 2 examples, CD is well defined. A 2012 study examining serum samples from 7798 patients in the National Health and Nutrition Examination Survey database from 2009 to 2010 found an overall prevalence of 0.71% in the United States. [6]

Neurologic manifestations associated with negative reactions to wheat proteins have been well documented. As early as 1908, "peripheral neuritis" was thought to be associated with CD. [7] A review of all published studies on this topic from 1964 to 2000 indicated that the most common neurologic manifestations associated with GS were ataxia (35%), peripheral neuropathy (35%), and myopathy (16%). [8] Headaches, paresthesia, hyporeflexia, weakness, and vibratory sense reduction were reported to be more prevalent in CD patients vs controls. [9] These same symptoms were more prevalent in CD patients who did not strictly follow a GFD vs those who were compliant with GFD.

At present, there are no case reports describing the chiropractic management of patient with gluten neuropathy. Therefore, the purpose of this case study is to describe a patient presentation of suspected gluten neuropathy and a treatment protocol using dietary modifications.

Case Report

A 28-year-old man presented to a chiropractic teaching clinic with complaints of constant muscle fasciculations of 2 years' duration. The muscle fasciculations originally started in the left eye and remained there for about 6 months. The patient then noticed that the fasciculations began to move to other areas of his body. They first moved into the right eye, followed by the lips, and then to the calves, quadriceps, and gluteus muscles. The twitching would sometimes occur in a single muscle or may involve all of the above muscles simultaneously. Along with the twitches, he reports a constant "buzzing" or "crawling" feeling in his legs. There was no point during the day or night when the twitches ceased.

The patient originally attributed the muscle twitching to caffeine intake (20 oz of coffee a day) and stress from school. The patient denies the use of illicit drugs, tobacco, or any prescription medication but does drink alcohol (mainly beer) in moderation. The patient ate a diet high in meats, fruits, vegetables, and pasta. Eight months after the initial fasciculations began, the patient began to experience gastrointestinal (GI) distress. Symptoms included constipation and bloating after meals. He also began to experience what he describes as "brain fog," a lack of concentration, and a general feeling of fatigue. The patient noticed that when the muscle fasciculations were at their worst, his GI symptoms correspondingly worsened. At this point, the patient put himself on a strict GFD; and within 2 months, the symptoms began to alleviate but never completely ceased. The GI symptoms improved, but he still experienced bloating. The patient's diet consisted mostly of meats, fruit, vegetables, gluten-free grains, eggs, and dairy.

At the age of 24, the patient was diagnosed with WA after seeing his physician for allergies. Serum testing revealed elevated IgE antibodies against wheat, and the patient was advised to adhere to a strict GFD. The patient admits to not following a GFD until his fasciculations peaked in December 2011. In July of 2012, blood work was evaluated for levels of creatine kinase, creatine kinase–MB, and lactate dehydrogenase to investigate possible muscle breakdown. All values were within normal limits. In September of 2012, the patient underwent food allergy testing once again (US Biotek, Seattle, WA). Severely elevated IgG antibody levels were found against cow's milk, whey, chicken egg white, duck egg white, chicken egg yolk, duck egg yolk, barley, wheat gliadin, wheat gluten, rye, spelt, and whole wheat (Table 1). Given the results of the food allergy panel, the patient was recommended to remove this list of foods from his diet. Within 6 months of complying with the dietary changes, the patient's muscle fasciculations completely resolved. The patient also experienced much less GI distress, fatigue, and lack of concentration.

Discussion

The authors could not find any published case studies related to a presentation such as the one

Table 1 Food Sensitivity Test Results

Food Category	Reaction Class	Food Category	Reaction Class	Food Category	Reaction Class	Food Category	Reaction Class
Casein	3	Almond	1	Lemon	0	Onion	0
Cheddar cheese	3	Amaranth	0	Orange	1	Green bell pepper	1
Cottage cheese	4	Barley	4	Papaya	0	Sweet potato	0
Mozzarella cheese	4	Kidney bean	0	Peach	0	White potato	0
Milk	6	Lima bean	1	Pear	0	Pumpkin	0
Goat milk	2	Pinto bean	0	Pineapple	0	Radish	0
Whey	6	Soy bean	3	Plum	0	Spinach	0
Yogurt	3	String bean	1	Raspberry	0	Zucchini squash	0
Beef	0	Buckwheat	1	Strawberry	0	Tomato	2
Chicken	2	Coconut	1	Clam	0		
Chicken egg whites	6	Corn	1	Cod	0		
Duck egg whites	5	Wheat gliadin	5	Brab	0	**Key**	
Chicken egg yolk	6	Wheat gluten	6	Halibut	0	**0 = no reaction**	
Lamb	0	Hazelnut	0	Lobster	0	**6 = extreme reaction**	
Pork	0	Lentil	0	Red snapper	0		
Turkey	0	Oat	3	Salmon	0		
Cocoa bean	0	Green pea	0	Scallop	0		
Coffee bean	0	Peanut	1	Shrimp	0		
Bee honey	0	Pecan	2	Sole	0		
Sugar cane	0	White rice	2	Tuna	0		
Baker's yeast	1	Rye	5	Cabbage	0		
Brewer's yeast	0	Sesame seed	1	Carrot	0		
Apple	0	Spelt	6	Cauliflower	0		
Apricot	0	Sunflower seed	0	Celery	0		
Banana	0	English walnut	0	Cucumber	0		
Blueberry	0	Whole wheat	6	Garlic	2		
Cranberry	1	Avocado	0	Lettuce	0		
Grape	0	Beet	0	Mushroom	0		
Grapefruit	1	Broccoli	0	Olive	0		

described here. We believe this is a unique presentation of wheat protein reactivity and thereby represents a contribution to the body of knowledge in this field.

This case illustrates an unusual presentation of a widespread sensorimotor neuropathy that seemed to respond to dietary changes. Although this presentation is consistent with gluten neuropathy, a diagnosis of CD was not investigated. Given the patient had both GI and neurologic symptoms, the likelihood of gluten neuropathy is very high.

There are 3 forms of wheat protein reactivity. Because there was confirmation of WA and GS, it was decided that testing for CD was unnecessary. The treatment for all 3 forms is identical: GFD.

The pathophysiology of gluten neuropathy is a topic that needs further investigation. Most authors agree it involves an immunologic mechanism, possibly a direct or indirect neurotoxic effect of antigliadin antibodies.[9,10] Briani et al[11] found antibodies against ganglionic and/or muscle acetylcholine receptors in 6 of 70 CD patients. Alaedini et al[12] found antiganglioside antibody positivity in 6 of 27 CD patients and proposed that the presence of these antibodies may be linked to gluten neuropathy.

It should also be noted that both dairy and eggs showed high responses on the food sensitivity panel. After reviewing the literature, no studies could be located linking either food with neuromuscular symptoms consistent with the ones presented here. Therefore, it is unlikely that a food other than gluten was responsible for the muscle fasciculations described in this case. The other symptoms described (fatigue, brain fog, GI distress) certainly may be associated with any number of food allergies/sensitivities.

Limitations

One limitation in this case is the failure to confirm CD. All symptoms and responses to dietary change point to this as a likely possibility, but we cannot confirm this diagnosis. It is also possible that the

symptomatic response was not due directly to dietary change but some other unknown variable. Sensitivity to foods other than gluten was documented, including reactions to dairy and eggs. These food sensitivities may have contributed to some of the symptoms present in this case. As is the nature of case reports, these results cannot necessarily be generalized to other patients with similar symptoms.

Conclusion

This report describes improvement in chronic, widespread muscle fasciculations and various other systemic symptoms with dietary change. There is strong suspicion that this case represents one of gluten neuropathy, although testing for CD specifically was not performed.

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